

**The Faculty Senate
The City College of New York**



**Proposed: December 18, 2014
Adopted:
Vote:**

Plenary Meeting

December 18, 2014
Shepard Hall 250

AGENDA

Call to order	2:00 PM
Approval of the minutes from Plenary Meeting of November 20, 2014	2:05 PM
Remarks of the Chair	2:05 – 2:15 PM
Proposal for to establish a Program in Translational Medicine leading to a Master's of Science Degree (GSOE and SDSBE)	2:15 – 2:25 PM
Reports from Faculty Senate Committees	2:25 – 3:10 PM
i. Senate Affairs	
a. Phase 2 of the process to revise the Faculty Senate Bylaws	
ii. Executive Committee	
a. Appointment of the Faculty Senate Auxiliary Committee on Diversity	
Discussion of the email from Ms. Denise C. Dyce (Director of Labor Relations at the City College of New York) titled "Faculty Senate Internal Investigation: Findings and Conclusions"	3:10 – 3:25 PM
Resolution to Stop Racism	3:25 – 3:35 PM
Report of the Ombuds	3:35 – 3:40 PM
Old Business	
New Business	
Adjournment	3:40 PM

**The Faculty Senate
The City College of New York**



Proposed: December 18, 2014
Adopted: December 18, 2014
(Unanimous)

**Minutes of the
Faculty Senate Plenary
November 20, 2014
Shepard Hall 250
The City College**

Present: Provost Trevisan; Senior Associate Provost Cintron; Chief of Staff H. Balmer; Executive Counsel Occhiogrosso; Chief Diversity Officer M. Baptise; Deans: G. Barabino, J. Mercado, Director M. Brownlee; Chief Librarian C. Stewart; Senators: D. Akins, R. Alfano, M. Bengoa-Calvo, M. Binz-Scharf, R. Calichman, MT. Chang, W. Crain, B. Cronin, C. Dalglish, J. Davis, R. Dorsinville, I. Estrada, A. Feigenberg, K. Foster, E. Friedman, B. Fu, J. Gallagher, A. Gilerson, J. Gonzalez, M. Gutman, E. Handy, A. Janakiraman, D. Jeruzalmi, B. Judell, A. Kisery, R. Kooder, A. Kornhauser, J. Levinson, D. Lohman, R. Menon, R. Miller, C. Moore, F. Moshary, S. O'Donnell, S. Pittson, S. Rings, S. Schaller, J. Tarbell, T. Thayer, J. Tu, S. Van North, D. Weissman

Guests: A. Alting, A. Blutreich, A. D'Antoni, J. Dorn, S. Goyert, T. Horvath, R. Kalia, A. Kottmann, A. Mantovani,
T. Montini, S. Pinol-Roma, A. Ragnauth, N. Roberts, C. Wolf, C. Yilmaz

Student Representatives: C. Pazmino, K. Soto, J. Wishnoff,

Excused: V. Diyamandoglu, T. Watson

1., The meeting was called to order (2:08 PM)

2., The minutes of the October 30, 2014 meeting were approved. (2:08 PM)

3., Remarks of the Chair – Prof. Jeruzalmi (2:11 PM)

- as part of the Senate outreach program, the Executive Committee met with representatives of the School of Education
- Denise Dyce's letter and its recommendations. The Chair noted that the recommendations were not only inaccurate about electoral misconduct and recordkeeping practices, but that they were based on an investigation conducted inappropriately, and in open conflict with CCNY regulations and bylaws. Allegations of discriminatory practices and discriminatory uses of language are serious charges that ought to be brought through the Office of Affirmative Action – which did not happen here.

The Chair noted that he requested the President to do so, for the sake of the accuser, the accused, as well as of the College. The Chair here allowed a question. The Chair pointed out that his aim was not to dismiss the charges out

of hand, but rather to indicate that the charges were never even made explicit, they were made in secret and kept secret, they were not even revealed to the senate, and that it was the investigation took a secretive route when it did not give an opportunity for those accused to be heard or even informed of the charges levelled against them.

Senator Crain moved to put the issue on the agenda of the December meeting.

3., Reports from Faculty Senate Committees (2:27 PM)

i. Resolution on the expansion of the Sophie Davis School for Biomedical Education
In the discussion, Provost Trevisan explained that the new tuition model will guarantee that 70% of students will pay the same tuition as now. Scholarships are already in place but more is needed from the State. He emphasized that the expansion will have no impact on existing college infrastructure; there is no new building needed.
The resolution passed 41:1:0. (2:55pm)

ii. The revisions to the Bylaws previously presented by the Senate Affairs Committee were passed by acclamation. (3:00pm)

iii. Executive Committee

a. Revised draft of the Resolution for establishing a CCNY Office of student recruitment, first presented at the October meeting, was passed by acclamation. (3:09pm)

A proposal to constitute an auxiliary committee on diversity (because of its importance for the College as a minority-serving institution) was accepted by acclamation (3:10pm)

b., On the state of the resolution on facilities of April 20, 2014, the Executive Committee reported that progress reports were requested and received from the president and the College-Wide Resources Committee will consider them and report to the plenary. (3:13pm)

4., Old business

The resolution proposed by Senator Crain on the Ebola crisis passed with one abstention. (3:18)

5., New business

Prof. Feigenberg proposed limiting the use of paper in conducting Senate business. (3:22)

The meeting was adjourned at 3:22 pm

Respectfully submitted,

András Kiséry, secretary

Chair's Report
David Jeruzalmi

121814

Let me start by wishing you all Happy Holidays. Happy Hanukah, Merry Christmas, Happy Kwanzaa, Happy 2015.

I will be very brief today. I have just one announcement and one action to bring to you that is a holdover from two meetings ago. A number of you have reached out to me about the closing of the City College Childcare Development Center. This is an important resource used by many in the College community. Per the President's office, the Center, built in 1912, will undergo a much-needed facelift to improve the quality of space and modernize the facility, including an outdated HVAC system. The center will close June 2015 for the required renovations. Designated funding will be used for renovations, which are expected to take at least one year. City College will assist parents for one year by providing subsidies for the differential in child care tuition, not to exceed market rate, for students enrolled in the 2014-2015 academic year. City College also will provide parents with a listing of other childcare centers near the campus. Retraining and job placement assistance will be provided for childcare center staff since the facility will be closed while renovations take place. City College intends to reopen the center once renovations are complete.

One vacancy in the City College delegation to the UFS. I have one nomination. Professor Renata Miller.

DRAFT

**City College of New York
of
The City University of New York**

PROPOSAL TO ESTABLISH A PROGRAM IN TRANSLATIONAL MEDICINE
LEADING TO THE MASTER'S OF SCIENCE DEGREE

EFFECTIVE FALL 2015

SPONSORED BY THE GROVE SCHOOL OF ENGINEERING AND THE SOPHIE
DAVIS SCHOOL OF BIOMEDICAL EDUCATION

APPROVED BY CITY COLLEGE OF NEW YORK GOVERNANCE

	<u>Dates</u>
Grove School of Engineering Faculty	<u>November 30, 2014</u>
Sophie Davis School of Biomedical Education	<u>December 13, 2014</u>
CCNY Faculty Senate	_____

College representative: Dr. Mitchell B Schaffler, CUNY Distinguished
Professor of Biomedical Engineering, Grove School
of Engineering

Contact Dr. Mitchell B Schaffler

Telephone 212-650-5070
Email mschaffler@ccny.cuny.edu

Provost Signature _____

1. PURPOSE AND GOALS

Development of new health technologies and interventions must increase in speed and efficiency in order to address emerging challenges and the demands of rapidly changing health care delivery systems. The practice of moving discoveries from the laboratory through clinical testing to health-improving products has been led by mostly self-taught professionals stumbling through a multitude of complex challenges. It is obvious that better training is necessary to introduce to a larger cadre of professionals information and skills that can facilitate the efficient translation of research ideas into clinical healthcare and wellness promotion.

The City College of New York proposes to establish a professional Masters level program in Translational Medicine (MTM) program that will provide opportunities for students from diverse academic backgrounds to gain expertise in applying translational science and engineering approaches to produce practical solutions for health. The program will engage collaborating faculty from across the campus, especially the School of Engineering, the Sophie Davis School of Biomedical Education and the Division of Science, and will be administered from the Grove School of Engineering, Department of Biomedical Engineering (BME). External experts from regional health-related technology companies will also be recruited to participate as project mentors. Drawing on the technical and clinical strengths of the various Schools and collaborating external partners in the New York Center for Biomedical Engineering (the NYCBE is the CUNY Institute that partners CCNY BME with most of the academic medical centers in NYC), the MTM program is expected to be especially attractive to a broad range of students including graduate students, fellows, and practicing professionals from backgrounds of engineering, science, medicine, pharmacy, nursing, dentistry, law, and healthcare business.

“Translational Medicine” as applied to technology refers to the process of transforming — or “translating” - basic science discoveries into practical medical technologies for use with patients. Such technologies include therapeutic drugs, medical devices, diagnostic reagents, and computer applications. Through the professional MTM program students will learn the skills to integrate the science, technology, and business expertise required to drive scientific discoveries into public use for the improvement of health. The program leverages expertise and technological resources of the City College such that students will acquire the skills to address real-world problems creatively in an interdisciplinary team setting. Coursework includes hands-on instruction in core engineering fundamentals; physiology and disease processes; pre-clinical testing and clinical trial design; regulatory issues; ethics; and the business and economics of healthcare product development. Student achievement will be individually assessed, but students from different educational backgrounds will work in teams, integrated through group capstone projects and

interdisciplinary mentoring. The program will benefit from synergies with existing and emerging graduate education programs at City College, with training opportunities and cross-disciplinary collaboration fueling greater creativity and underlining the unique strengths of the College.

The rationale for a product-driven translational medicine master's program is strong. While investment in biomedical research by government and industry has more than doubled over the last decade, the pace of practical advances in therapeutics and diagnostics has lagged dramatically; in fact, the rate of U.S. Food and Drug Administration (FDA) approvals for new drugs and devices has decreased over that time. Similarly, while the pace of technological development has been staggering and has produced dramatic reductions in costs in many arenas outside of healthcare, the biomedical enterprise remains mired in inefficiencies and distractions. Very few educational programs have attempted this focus on integrating *engineering and biomedical* aspects of advancing healthcare, and even fewer also integrate education in entrepreneurship and business practices – essential tools for effectively commercializing scientific discoveries and technology innovations for broader clinical or societal use. Bringing engineers and biomedical professionals together will produce synergies that are only sporadically realized today.

Our proposed program is unique. Traditional curricula in the life sciences have not included the understanding of technological development that is required in many areas of the current clinical enterprise. Similarly, curricula in traditional engineering disciplines lack biomedical content, and even biomedical engineering curricula tend to lack a strong clinical applications component and an understanding of the clinical interfacing and technology translation. Conversely, physicians often encounter challenges and limitations in care delivery that could be addressed through basic science discoveries, engineering design and technology development. We believe there is a large unmet need for an academic environment that fosters interactions between physical and life sciences and that teaches students to solve clinical problems using modern engineering tools. Our proposed MTM degree will fill that need. It will give students the ability to integrate principles from diverse fields to span the gap between basic science advances and their clinical utilization. It will position its graduates to be leaders and significant contributors at a critical juncture in the advancement of healthcare.

2. NEED AND JUSTIFICATION

CCNY's proposal for the development of an MTM degree program is driven by the mounting demand for engineers, physicians, scientists, and other professionals who can successfully translate our abundant science and technology innovations into actual advances in patient health and healthcare. It is always heart-wrenching when news about medical research breakthroughs that might unlock the answers needed to combat cancer, neurological diseases, HIV/AIDS, and a host of other enigmatic diseases concludes with the caveat that these advances will not be available to patients for many more years. People with the skills and understanding to translate breakthroughs from "bench to bedside" are critical to breaking this barrier to accelerated and improved patient care.

The National Institutes of Health, the nation's leading arbiter of medical research directions, has given translational medicine a high priority, and recently established a new National Center for Advancing Translational Sciences (NCATS). In announcing the center, NIH director Francis S. Collins laid out the problems that would be addressed by an intensified national focus on translation ("Reengineering Translational Science: The Time is Right," *Science Translational Medicine*, July 6, 2011):

"Despite dramatic advances in the molecular pathogenesis of disease, translation of basic biomedical research into safe and effective clinical applications remains a slow, expensive, and failure-prone endeavor..." The new NIH focus on translational medicine and science, like our proposed MTM program, aims *"to pursue opportunities for disruptive translational innovation."* Director Collins goes on to say, *"The medical benefits of the current revolution in biology clearly cannot be achieved without vigorous and effective translation. Yet the triple frustrations of long timelines, steep costs, and high failure rates bedevil the translational pathway. The average length of time from target discovery to approval of a new drug currently reaches 13 years, the failure rate exceeds 95%, and the cost per successful drug exceeds \$1 billion..."*

The Obama Administration has underlined the importance of expediting translation by backing the new NIH effort with an unusual degree of support, trimming funding for some 27 other medical research centers in order to shift the discipline's focus to advancing translational medicine (according to a report in the *New York Times*, "Federal research center will help develop medicines," January 22, 2011). *"Concerned about the slowing pace of new drugs coming out of the pharmaceutical industry,"* the report says, the administration has invested in the billion-dollar NIH translational science center.

Further, Governor Andrew Cuomo of New York State has recently launched (New York City, October 22, 2013) a new initiative dubbed StartUpNY that is aimed at

facilitating university research translation, technology development, job creation, and overall economic growth for New York State. City College has been named one of 68 statewide hubs for the tax-free business incubators the state is sponsoring. This extraordinary program presents unprecedented opportunities for City College, including: translational opportunities for our discoveries and inventions, motivation for students choosing careers in translational science, recruitment avenue for enrollment in our MTM program, and academic-industry partnerships that would enrich our overall curriculum while supporting new initiatives to raise the City College experience for all stakeholders.

Thus, to help lead the way in providing graduates with the skills to capitalize on fundamental research and translate such to meaningful and timely advances for patients, CCNY is making translational medicine a priority for our engineering, science, and biomedical disciplines. Dozens of other institutions are embarking on various approaches in responding to this clarion call. At UCSF, for example, the campus web site makes its statement emphatically: *“The pursuit of translational medicine — the process of applying ideas, insights and discoveries generated through basic science research to improving human health — is one of UCSF’s priorities as it advances into the next decade of the 21st century.”* Our approach and that of a few other institutions that have launched similarly focused programs (e.g., UCSF, Berkeley, Rochester, Case Western Reserve University, Iowa), focuses on product translation rather than procedural or behavioral translation, thus carving out an enviable niche within which to compete and thrive.

It is expected that most graduates of the MTM program will take positions in industries that deliver healthcare products or patient care. We expect a sizeable number also to go into starting their own technology companies aimed at developing their own or licensed inventions. At the 2013 Annual University Startups Conference (National Council of Entrepreneurial Tech Transfer, Washington, DC), presentations and conversations with representatives from industry and venture capital firms that fund new biotechnology enterprises affirmed the need for graduates with a solid understanding of translational medicine. A common career path for MTM students, therefore, might be through the pharmaceutical and health industry, where they would be involved in developing medications and medical devices and carrying out pre-clinical and clinical trials. We expect to see an increase in these roles due to changes in market demand and the industry’s need to speed up the systems and increase the efficiency of the “drug discovery to market” process. Many graduates will be poised for entrepreneurship opportunities, where they translate academic discoveries to start-up or growth-phase companies. Our students may also work for government labs (including environmental and public health agencies), contract research organizations, academic departments in universities, charity-funded research organizations, and other research institutes.

OPPORTUNITIES FOR PLACEMENT OF GRADUATES

It is expected that most graduates of the MTM program will take positions in industries that deliver healthcare products or patient care. We expect a sizeable number also to go into starting their own technology companies aimed at developing their own or licensed inventions. At the 2013 Annual University Startups Conference (National Council of Entrepreneurial Tech Transfer, Washington, DC), presentations and conversations with representatives from industry and venture capital firms that fund new biotechnology enterprises affirmed the need for graduates with a solid understanding of translational medicine. A common career path for MTM students, therefore, might be through the pharmaceutical and health industry, where they would be involved in developing medications and medical devices and carrying out pre-clinical and clinical trials. We expect to see an increase in these roles due to changes in market demand and the industry's need to speed up the systems and increase the efficiency of the "drug discovery to market" process. Many graduates will be poised for entrepreneurship opportunities, where they translate academic discoveries to start-up or growth-phase companies. Our students may also work for government labs (including environmental and public health agencies), contract research organizations, academic departments in universities, charity-funded research organizations, and other research institutes.

A final key point is that despite the incredibly rich environment in NYC for biomedical research, there is little in the way of focused training on translation in Medicine. The University of Rochester launched a translation Medicine program several years ago; there are no others in New York State at this time.

A further unique strength and opportunity is the New York Center for Biomedical Engineering (NYCBE). The NYCBE is a CUNY Institute that is a consortium of CCNY's Biomedical Engineering department and many of the research medical centers in NYC (member institution: Mount Sinai School of Medicine, Albert Einstein College of Medicine, NYU Schools of Medicine and Dentistry, Memorial Sloan Kettering Cancer Center, Hospital for Special Surgery, Sophie Davis). The NYCBE has operated for nearly two decades and has given rise to numerous NIH research and training grants and clinical-translational collaborations. Most importantly, the NYCBE has provided several generations of CCNY undergraduate and graduate student with a wealth of training opportunities. This large collaborative effort, unique in the USA, presents a powerful driver for Translational Medicine. Thus, the need is high and the opportunity is strong.

3. STUDENT INTEREST/ENROLLMENT

Applicants to the MTM program are expected to include students from a wide variety of educational backgrounds: on the one hand will be individuals with bachelor's degrees in engineering and biosciences as well as practicing engineers and engineering PhD students and postdoctoral fellows, and on the other hand we expect that there will be physicians, pharmacists, and other scientists and innovators.

The diversity in clinical, technical, and academic backgrounds of the students will be a strength of the program by stimulating cross-pollination of ideas and interdisciplinary practical projects.

In a 2011 online poll* sent to nearly UC San Francisco bioengineering undergraduates and recent alumni, 130 respondents answered questions regarding a master's in translational medicine program. When asked, "How interested would you be in pursuing a translational master's degree through this program?" 35% responded "Very Interested" on a scale of 1 (Not Interested) to 7 (Very interested), and over 67% of respondents indicated some level of interest. More than 36% of the respondents indicated that they are seriously considering pursuing a master's-level graduate degree. Of the responses from alumni currently working in industry, 44% said they would consider returning to school to pursue this type of degree. Additionally, of the responses from alumni who have or are currently pursuing a medical degree, 70% expressed at least some interest in the program, including 25% who were "very interested." Clearly, interest is high among current and former bioengineering students, signaling a clear demand within and probably across the discipline for the proposed degree. (*UCSF data supplied courtesy of Dr. Clay Johnson, Associate Vice Chancellor of Research).

We conducted a similar poll among our graduating seniors in Biomedical Engineering at CCNY (2013, 2014), and found that the support for such a program was extremely high.

	1 Strongly Against	2 Against	3	4 Favor	5 Strongly Favor
Should the scope of the undergraduate Senior Design BME 450 and BME 460 courses be extended into the Masters level?	0%	0%	4%	26%	70%
Should an MTM program include a strong business component?	0%	2%	5%	17%	74%
Should an MTM provide a strong background in intellectual property and patenting?	0%	4%	5%	26%	65%
Should an MTM link clinical professional with biomedical engineers and scientists to solve contemporary clinical problems?	0%	0%	0%	13%	87%
Should an MTM program provide a strong background in contemporary clinical challenges?	0%	0%	4%	26%	70%
Should an MTM program provide a strong background in contemporary medical device needs & clinical challenges?	0%	0%	5%	30%	65%
Should an MTM program contain a strong emphasis in device regulations (FDA) & quality assurance?	1%	1%	4%	16%	78%
Should the program bring experts to the classroom and take students out of the classroom for “field” research/analysis?	0%	0%	0%	9%	91%
Would you support creating a Masters of Translational Medicine at CCNY?	0%	3%	10%	12%	73%
Are you interested in applying to the program?	6%	14%	9%	21%	50%

Lastly, another factor in the high volume and quality of student demand for MTM-like degrees is the strong evidence that earning such a degree, like most technology-intensive graduate degrees, will elevate students’ career earning potential [average Master’s

earning 15% or more greater than Bachelor's in engineering, Association of Engineering Societies — Engineering Workforce Commission (AAES-EWC) 2009].

RELATION OF THE PROPOSED PROGRAM TO EXISTING PROGRAMS

The proposed MTM program will not overlap with existing programs offered at City College or any of the other City University of New York (CUNY) colleges. First and foremost, it builds centrally on the core resources of the Department of Biomedical Engineering in Grove School of Engineering and the Sophie Davis School of Biomedical Education, which are unique to CCNY. Furthermore, despite the size and breadth of CUNY (24 campuses serving approximately 240,000 students), there are no undergraduate or graduate programs focused on translational biomedical challenges.

Indeed, the one existing BME master's program is research-focused, leading to an MS degree. While some BME Masters graduate move into R&D positions in industry, the majority continue on to PhD programs.

Conversely, the translational challenges that must be met by graduates of the proposed MTM program necessitate their understanding of the regulatory environment, economic challenges complicated by the healthcare cost structure, and the realities of healthcare practices, from operating room procedures to patient behavior.

The proposed program aims to meet those needs and will provide the strong clinically relevant product emphasis necessary for graduates to compete and lead in this emerging arena. Moreover, core coursework in the areas of business, leadership, and product development will be woven into the program's scientific, clinical, and engineering core to provide students a cutting edge foundation for this specialized field.

ADMISSION REQUIREMENTS AND PROCESS

Applicants to the MTM program are expected to include students from a wide variety of educational backgrounds: on the one hand will be individuals with bachelor's degrees in engineering and biosciences as well as practicing engineers and engineering PhD students and postdoctoral fellows, and on the other hand we expect that there will be physicians, pharmacists, and other scientists and innovators. Applicants seeking admission to the MTM program should have a high degree of demonstrable technical and scientific aptitude, as evidenced by successful completion of relevant, rigorous coursework and professional experience. The MTM degree program will have the same rigorous academic criteria for admission as professional graduate-level programs at City College.

While the requirements expected of successful applicants will be consistent with City University of New York standards, the expectedly diverse academic and experiential backgrounds of eligible applicants will necessitate flexibility in our application of specific criteria. A bachelor's degree, or a first-professional degree such as Bachelors in engineering, life sciences, or related discipline and professional degrees in health fields (medical, dental, veterinary, pharmacy) from a qualified institution will be required. Applicants will be evaluated on their undergraduate and graduate coursework, the rigor of the major(s), the competitiveness of their academic institution(s), and their undergraduate and graduate grade point averages as applicable. Prior research or industry experience, especially in a translational area, will be considered as well. Applicants will be required to take the GRE or the MCAT or DAT, and consideration will be given to their performance on those exams and, if required, the TOEFL (expected score of 550 or higher). The resume or curriculum vitae, personal statement, and two letters of recommendation will be evaluated for indications of academic promise, career objectives that align with the program, and leadership potential. Students should be prepared for a possible interview, and should be able to clearly demonstrate their career commitment in translational medicine.

TIMETABLE FOR PROGRAM DEVELOPMENT AND ENROLLMENT PROJECTIONS

Planning for this degree program began in earnest in 2013. An *ad hoc* program committee was assembled with representation from several academic units with direct experience in translational Medicine: the Department of Biomedical Engineering (lead department, the Sophie Davis School of Biomedical Education and the Departments of Biology, Chemistry and Physics in the Division of Science. The Office of the Provost assumed a lead role in convening and moderating the discussions. This review led to the discovery that many of the MTM program elements are already in place: 1) Clinical training and research in the Sophie Davis School, 2) Technical and translational research and coursework through the Department of Biomedical Engineering and the New York Center for Biomedical Engineering [the biomedical engineering consortium of the CCNY BME department with major research medical centers in New York City]; 3) Leadership and entrepreneurship training at the Grove School; and 4) Biomedical engineering product development mentoring built on the deep expertise of faculty in BME and modeled on their successes in design projects and technology spinoff. Moreover, the opening of the new City College Research Building as well as the CUNY Advanced Science Research Center will provide space for new faculty in thematic areas that are directly relevant to the MTM program.

The projections and timeline for MTM enrollment for its first three years are shown in Chart 1. Steady-state enrollment is anticipated to be 24. Any change in enrollment targets in later years would be based on the success of the program and determined in conjunction with overall enrollment targets for campus graduate programs.

Table 1:	Academic Year	MTM Enrollment Projection
	2015-16	8
	2016-17	16
	2017-18	24

4. CURRICULUM

The MTM will prepare engineers, bioscientists and physicians to bring innovative technologies and devices into clinical or field use. Most MTM graduates will be expected to work in settings that deliver healthcare products or provide patient care. The core approach to our MTM program is that the engineering, clinical research and entrepreneurship training for each student culminate in an interdisciplinary design-project experience mentored by a cohort of CCNY and NYCBE faculty members who are accomplished in translational medicine.

Each student will be assigned an academic adviser to help develop the student's individual study plan. Students will take didactic courses in three different core areas: 1) Biomedical and clinical sciences and engineering, (2) Clinical Evaluation and (3) Business Principles and Entrepreneurship. Students will complement this core knowledge with Elective courses as determined by the particular student's academic needs. The engineering thrust will be flexible enough to accommodate interest and projects in diverse fields such as imaging, biotechnology, electromechanical systems, tissue engineering, drug delivery, and medicinal chemistry. Medical science and Clinical evaluation will prepare students to identify or appreciate disease targets or diagnostic candidates to which engineering principles could be productively applied, and to understand testing of products in a clinical trial setting. The addition of Business Principles and Entrepreneurship courses will give MTM graduates the ability to consider the legal, economic, organizational, regulatory, clinical, and technical issues associated with translating a given piece of knowledge or technology into clinical use. Thus, trainees will be positioned to successfully pursue those projects and thus increase the rate at which bench research impacts patient care.

The Capstone project - Critical to the education is the required Capstone component, the *BioDesign project sequence*, which will synthesize the technical, clinical, economic, and regulatory issues involved in design and market implementation of medical devices, diagnostics or therapeutic modalities that are introduced in the coursework outlined above. *The capstone BioDesign project is a professionally-oriented research or creative endeavor culminating in a product or product concept and a written report.*

The approach to creating BioDesign projects for the program will leverage the remarkable and unique strength of the New York Center for Biomedical Engineering (NYCBE), the consortium of CCNY's Biomedical Engineering department and many of the research medical centers in NYC and industry partners in the NYC region. Already, we have a queue of partners from NYCBE institution and industry partners, that come to CCNY each year with real world clinically-driven needs seeking translational solutions.

The MTM Program Committee will select BioDesign projects from these translationally relevant opportunities from our clinical, academic, and industry partners, aiming to incorporate emerging technologies, industry requirements, and the potential for significant economic or social impact with regard to medicine and healthcare. Project leaders (faculty and external partners) will be identified for each project, and non-clinical project leaders will be required to have a clinical collaborator for their project.

Each BioDesign project will engage project teams of approximately 3-5 students, and individual team members may work on the same or separate components of the project. The BioDesign project team will meet at least once a week, typically with the project leader and/or course director, to engage in discussion focused on understanding and overcoming technical risks, marketplace risks, industry barriers, and potential policy risks. In tandem, the team develops and tests a tangible work product that responds to a clinical or industry identified problem. For successful completion, each student must file and publicly present a final report that includes a business model developed as part of the BioDesign course. *Our BME Department has extensive experience with such projects, and multiple products of such projects have gone on to patent and early commercial development.*

The capstone BioDesign sequence will consist of 8 credits plus a 1 credit course on Cost Analysis and Business considerations in Translation taken at the start of the BioDesign sequence. Students can distribute the 9 total semester units evenly over the registered semesters, although many may elect to take more units in later periods after completing several preparatory courses. The BioDesign Course Director will work with project leaders to ensure that the projects adhere to training requirements and objectives, and that expectations of the students are consistent across projects. Although the BioDesign project will involve group teamwork (as in the real world), each student will be individually evaluated on design, analysis, synthesis, and communication skills based on a particular capstone topic, as well as the engineering fundamentals relevant to the particular project.

The Core Courses of the curriculum are required of all students (although a specific course can be waived for a particular student who has already achieved the learning objectives of that course, and an appropriate substitute course will be identified). These courses draw on existing courses at CCNY's Biomedical Engineering and other graduate programs, and additional new courses will be developed specifically for the MTM program. The new courses will be developed and taught by interdisciplinary teams that include faculty from the School of Engineering, Sophie Davis School of Medicine, and the CUNY office of Industrial-Academic Research. Approved Elective Courses will be drawn from a range of

courses offered at CCNY graduate programs, and in regionally offered professional outreach courses targeted to the biotechnology and pharmaceutical industry. Finally, the BioDesign Project sequence is an 8-credit composite course (described previously) that is run by interdisciplinary teams from the academic divisions participating in the MTM program at CCNY, plus external advisors.

STUDENT PATHWAYS:

Full-time student in the MTM program will typically earn their Master’s degree in one year (two academic semesters and one summer, see Table sample curriculum). The program can accommodate part-time students as well, but given that core course will only be offered annually, part-time trainees will need to work within that constraint. The BioDesign course sequence will need to be completed consecutively as the training is project- and team-based.

TABLE 2: SAMPLE COURSE CURRICULUM LIST FOR FULL TIME STUDENTS IN THE MTM PROGRAM

Fall Semester	Spring Semester	Summer Semester
SDSM I6XXX Translational Challenges in Clinical Medicine (3 Cr)		SDSM I8XXX Biomedical Ethics and Responsible Conduct of Research (1 Cr)
BME I6100 Intellectual property, Regulation and Quality Assurance (3 Cr)	BME I7100 Translational Challenges in Diagnostics, Devices and Therapeutics (3 Cr)	SDSM I8XXX Clinical and Translational Research Methods (2 Cr)
BME I6200 Cost analysis and the business of translation (1 Cr)	BME I7200 Engineering, Entrepreneurship and Business Leadership (3 Cr)	
BME I6500 BioDesign I: Need finding and screening (2 Cr)	BME I6600 BioDesign 2: Conceptual Innovation (3 Cr)	BME I6700 BioDesign 3: Translational solutions (3 Cr)
Elective Course (3 Cr)	Elective Courses (3 Cr)	
FALL SUBTOTAL: 12 Cr	SPRING SUBTOTAL: 12 Cr	SUMMER SUBTOTAL: 6 Cr
		GRAND TOTAL: 30 Credits

Detailed presentation of curriculum, and descriptions and syllabi for new course are presented in Appendices A-B

5. ARTICULATION AGREEMENTS

No new agreements are required. All core graduate coursework and most graduate electives are or will be available at CCNY. Some graduate electives can be taken at NYCBE medical school partners through agreements established nearly two decades ago by the creation of the CUNY Institute, the NYCBE. Graduate Design projects with clinical partner in the NYCBE (a long successful model for CCNY-CUNY) are negotiated on an individual project basis, and are handled by CUNY under rules pertaining to intellectual property

6. FACULTY AND RESOURCES

FACULTY:

Students in the MTM degree program will enroll in graduate courses taught by tenured, tenure-track and adjunct faculty from biomedical and other engineering departments and the School of Biomedical Education. In addition, guest lecturers will be recruited from relevant businesses, the NYCBE and the broader academic community to teach in specialized courses in which they present particular strengths.

The biomedical engineers, basic and clinical scientists who will serve as faculty for this program collectively have extraordinary depth and breadth of experience in teaching and conducting translational research. At this time, this includes the entire faculty of the CCNY Biomedical Engineering department and most of the Sophie Davis School of Biomedical Education.

New course offerings should not impact on the staffing of current course offerings. The major involvement for existing faculty will be to provide guest lectures in new courses, and input on BioDesign projects as appropriate based on expertise. There is sufficient capacity in existing graduate courses that the addition of a few more graduate students to existing elective course should not be problematic. Thus, implementation of the program poses minimal workload implications for existing faculty.

The most teaching and contact hour-intensive of the new courses proposed will be staffed by new faculty specifically recruited for this unique program. We project that two new FTE faculty lines will be necessary for providing the additional innovations in the curriculum (BioDesign capstone course, Engineering, Entrepreneurship and Business Leadership course, Clinical research course) and supporting the course development and delivery efforts so that implementation of the program poses minimal workload

implications for existing faculty. Estimates concerning possible instructional backup are provided in the planning budget, discussed below. These new positions are projected in the budget presented in the next section. Funding is already in place for these positions, and recruitment is expected to begin by December 2014.

FACILITIES AND EQUIPMENT

This program will benefit from the combined facilities of the Grove School of Engineering, the Division of Science, the Sophie Davis School of Biomedical Education and the CUNY Institute, the NYCBE. All have classrooms equipped with PowerPoint projection systems and large lecture halls suitable for seminars. With the scheduled opening of the new research building on the CCNY south campus in Spring 2015 and attendant relocation of programs, the additional space needed for the proposed program will be available, as per the Provost.

The Zahn Center for Innovation serves as an incubator that nurtures entrepreneurial initiatives at the City College of New York. It provides co-working spaces for its technology start-ups and social ventures and an ongoing, campus-wide speaker series. It also provide expert pro-bono services for legal, Intellectual Property, incorporation, and accounting support. For technology and hardware based start-ups the Zahn Center has a wide range of prototyping capabilities including 3D printing, laser cutting and machining.

7. COST ASSESSMENT

We model this as a 12-month fulltime MTM program, designed for steady-state enrollment of up to 24 students per year. We hope to enroll our first class of 12 students for the degree in Fall 2015, and to ramp up to steady state over three years. An enrollment of 24 students should be sufficient to sustain the program. External financial support will be needed to start and ramp up the program. Additional support will continue to be raised in subsequent years to provide for need-based scholarships, considering the anticipated attractiveness of our program to qualified candidates from disadvantaged backgrounds. Indeed, our record of success in training students from diverse and disadvantaged backgrounds should make us attractive to similar populations of program applicants.

We believe we can readily achieve our steady-state target of 24 students within the three-year time frame, given the extremely high demand for biomedical engineering and translational programs and the historically outstanding quality of applicant pools attracted to other biomedical engineering degree programs at CCNY and regionally. Although the MTM program will have an additional financial expense to be borne by the students in the form of the summer and differential tuition payments, total cost of the CCNY program will still be significantly lower than the cost of similar programs regionally or nationally.

The MTM program will be expected to be funded via a combination of sources: Philanthropy, State budget support of teaching faculty, Summer term tuition payments, Differential tuition (DT) revenues and Special technical fees.

With regard to specific Philanthropy, The Grove Foundation has already made a substantial direct commitment with CCNY matching to help launch the MTM program. Those funds are currently available for the program.

Table 3 shows tentative estimates of funds sources for the first five years of program startup, granted that enrollment targets of 8 ramped up to 24 students. Business Model assumptions:

- To be conservative in our assumptions, projections are based solely on In-State enrollments, though we certainly expect out of State students.
- We assume a Differential Tuition of \$3500/student/year as a high level professional program with emphasis on business and technology. This is similar to other CUNY professional Master's program
- = The plan shows estimates of tuition revenues if the College is approved to receive summer term tuition.
- The plan projects Special fees associated the high technology cost of teaching the BioDesign course sequence of \$2,000/student/year.

Beginning in the fourth and continuing through subsequent years, the MTM program will receive two new faculty lines from the College to support the long-term needs of the program. These will be based in the GSOE. In addition, the SD and GSOE will each support 25% of the salary of the executive director (through shared assignment of duties) starting in year 4.

Following the startup period, the program is expected to operate with net positive annual revenues. Such positive balances will be useful to support program enrichment activities, extraordinary student projects, expanded access for specialized populations of students, and fundraising efforts to secure additional revenues for scholarships.

Differential Tuition and Fee Details

To meet the financial needs of the program as detailed in the sections above, a combination of professional degree differential tuition (DT) and special fees will be charged to the students in addition to standard CUNY tuition and fees. The MTM program will charge all students, regardless of residency status, the DT fee

- The cost of instruction for this professional degree is high and consists largely of combined business and technical courses. The content, training levels and specialization of the program are on par other CUNY professional Masters degrees (e.g., MBA, MPA, MPS in Branding), hence the comparable DT projection.
- The cost of running the BioDesign sequence is also high, given the time and material intensive nature of this educational component and the manufacturing expenses, hence the incorporation of additional fees to deliver this specialized course content.

We plan to make a strong case to CUNY Central administration for CCNY to be authorized to receive the summer tuition payment together with the DT fee as operating revenue.

With the revenue from summer tuition and DT and fees plus the Grove gift funds, we project that the program will break even and possibly yield some excess revenue by the third year. At steady-state, any surplus revenue will be used for new course creation and unaccounted costs of elective course delivery, to improve the educational experience for students, and for extraordinary student projects, expanded access for specialized populations of students and fundraising efforts to secure additional revenues for scholarships.

Table 3					
Anticipated Expenses and Revenues for MTM program					
PROJECTED EXPENSES	Year 1	Year 2	Year 3	Year 4	Year 5
Faculty & Staff - FTE 1 - FTE 2 - Administrative Director	\$380,000	\$391,400	\$403,145	\$415,250	\$427,700
Instructional development costs	\$85,000	\$85,000	85,000	\$50,000	\$50,000
Program support -Seminars/speakers -IT -Recruitment -Scholarships -Travel	\$85,000	\$110,000	\$150,000	\$150,000	\$150,000
TOTAL EXPENSES	(\$550,000)	(\$586,400)	(\$638,145)	(\$615,250)	(\$627,700)
PROJECTED REVENUES					
- Start-up from Grove Foundation + CCNY Match	\$450,000	\$450,000	\$450,000		
- FTEs and operational from GSOE/SD				\$400,000	\$400,000
-Differential tuition (@\$3500/student/yr)	\$28,000	\$56,000	\$84,000	\$84,000	\$84,000
-Summer tuition (@\$3200)	\$45,600	\$91,200	\$136,800	\$136,800	\$136,800
-Special Fees (BioDesign @ \$2000 student/yr)	\$16,000	\$32,000	\$48,000	\$48,000	\$48,000
TOTAL REVENUES	\$539,600	\$629,200	\$718,800	\$643,800	\$643,800
NET PROGRAM BUDGET (Revenue - Expenses)	(\$10,400)	\$42,800	\$80,655	\$53,600	\$53,600

COST TO STUDENTS FOR THE PROGRAM

Taking into account standard CUNY/CCNY tuition and fees, the total cost to students of the one-year MTM program in 2014 is estimated to be \$18,250 for New York residents (approximately \$30,000 for non-residents). With these costs, the MTM program will be one of the more expensive Master's programs at the City College, although costs are in line with other high level professional training areas in CUNY. Ultimately, the City College MTM program will remain the least expensive in the region, and probably nationally.

STUDENT FINANCIAL SUPPORT

CCNY is dedicated to excellence in its educational programs, and also strongly committed to enrolling an exceptional and diverse student cohort. To this end, a portion of gifts received and the professional degree differential tuition (DT) revenues from the MTM program will be allocated to financial aid to help ensure that talented students who may not be able to afford the MTM program can indeed attend. In addition we will seek external gifts and other funding opportunities specifically to support eligible students. Financial aid will be offered to our MTM students in two categories: (1) need-based aid and (2) merit-based support.

In addition, the MTM program will establish a high-level MTM Advisory Board that will provide counsel and external advice to program faculty when examining the strategic directions of the program, while its fundamental purpose will be to help raise funds and mobilize other resources (e.g., new BioDesign project collaboration sites) to support student financial aid, capstone projects, and other program needs. A central, long-term goal for this innovative program (with breakthrough potential for the careers of minority and disadvantaged students) is to create an endowment that will help to secure ongoing support of student financial aid.

8. EVALUATION

INTERNAL EVALUATION AND OUTCOMES

Internal evaluation of the program will be modeled after an established procedure followed by the Grove School of Engineering (GSOE). This procedure was formulated and put into effect in 2000 to meet accreditation requirements.

The quality of the program will be evaluated annually by the MTM Advisory Committee (see Governance section). The committee will review program goals and objectives and monitor several indicators. This includes rating of all courses and instructors by students, tracking enrollment and attrition rates and placement of graduates, and assessing objectives and outcomes. Program alumni and employers will be surveyed annually to assess their evaluation of the program and its contribution to their profession. This important feedback will be used to fine tune the program and improve its effectiveness.

An integral component of the internal evaluation process is a clear definition of program objectives and outcomes. The desired program outcomes are:

- (1) Educating students for successful careers in translational medicine.
- (2) Providing graduates with the tools and skills needed to solve interdisciplinary biomedical problems.
- (3) Meet the projected demand by local, regional and national constituency for professionals with special training to solve complex interdisciplinary problems in translations.
- (4) Provide graduates with experience to work collaboratively in teams having diverse professional backgrounds.

The mechanisms by which the program objectives will be assessed are as follows:

- Alumni through surveys that quantify both the benefits of the program and the benefits of each program objective and course focus to their overall success
- Employer surveys (where appropriate given that some MTM graduates will create their own companies) that quantify both the benefits of the program and the benefits of each program objective and course focus to their overall success

The extent to which the program objectives are achieved will be based on demonstrated performance and achievements of students several years after they have graduated from the MTM program. The iteration process will involve inputs from all stakeholders (faculty, advisory board, employers and alumni).

In support of the program's assessment goals, we will develop a detailed contact database that will be used to contact students and employers. Alumni will be asked to rate to what extent the MTM program prepared them to achieve each program objective using a 1-5 rating scale (5 = Very well prepared, 4 = Well prepared; 3 = Sufficiently prepared; 2 = modestly prepared; 1 = Poorly prepared). Any mean score below 3 will indicate that a program objective was not achieved and the MTM Advisory committee in collaboration with the faculty will propose programmatic corrections as needed.

We will also use a combination of direct and indirect assessment tools to allow continuous feedback from the faculty and students. Assessment tools will include:

Direct

- Course assessment from faculty
- Feedback from faculty mentors and professional on translational projects
- Successes in technology development by MTM students

Indirect

- Course surveys
- General student surveys
- Exit surveys

Results of internal evaluations will be reported to the Deans of Engineering, Science and the Sophie Davis School.

EXTERNAL EVALUATION

The following outside reviewer has evaluated the proposed program. The report and curricula vitae are attached in Appendix XX.

Dr. Deepak Vashishth
Director of Rensselaer Center for Biotechnology and Interdisciplinary Studies
Rensselaer Polytechnic Institute
Troy, NY

9. GOVERNANCE

This interdisciplinary program will be housed in the Department of Biomedical Engineering and jointly administered with the Sophie Davis School of Biomedical Education and the Office of the Associate Provost for Research and Graduate Studies.

Prospective students will apply directly to the program, and admissions will be carried out by the MTM Program Committee, with faculty representatives from each of the participating Schools. The degree in the MTM program will be conferred jointly by the Grove School of Engineering and the Sophie Davis School of Biomedical Education. The Office of the Associate Provost will ensure that prior to program inception the Admissions Office and the Registrar's Office provide for coding and processing of the joint program in their systems.

The MTM Faculty Director will be named by the Provost upon recommendation of the Dean of the Grove School of Engineering, and will serve one-year appointments subject to renewal at the discretion of the Engineering Dean and the Provost. Each participating School will nominate a faculty lead to serve as Head adviser for that program area. Most likely, the Faculty Director will be one of the new faculty to be hired specifically for their expertise in critically missing intellectual areas of the MTM program. An Executive Director (staff) will coordinate administration and communications between the participating departments and schools, and will manage program needs, including recruiting, admissions support, planning and monitoring of design projects, and organization of meetings and events.

The Faculty Director, the BioDesign Course Director, the two divisional advisers (representing Medicine and Engineering), the Executive Director, and the Chair of Biomedical Engineering (or designee) will constitute the voting members of the MTM Advisory Committee, while the Associate Provost for Research and Graduate Studies, the Dean of Engineering, and the Dean of Medicine (or their designees) will serve as ex-officio members. The Faculty Director will serve as chair of the program committee. As required for the efficient operation of the program, other faculty may also be asked to serve one-year terms on this committee, at the discretion of the Directors and concurrence of the Provost. The Advisory Committee is charged to:

- Oversee program operations
- Manage program curriculum, including coursework and project selection
- Administer the admissions process (aided by admissions office staff)
- Identify candidates for financial aid
- Ensure program diversity through broad outreach to prospective students.

APPENDICES

APPENDIX A: COURSE DESCRIPTIONS FOR MTM

I. REQUIRED COURSES: CORE KNOWLEDGE

Translational Challenges in Clinical Medicine (3 Credits, new course)

The course provides an understanding of the nature of some of the technical and scientific limitations in treating people with serious diseases. Clinical faculty will present the challenges they encounter in their practice, and opportunities for advancing their fields by new discoveries. Students will actively participate in organizing the lectures and discussing potential experimental solutions to these problems. Course will include a survey of basic ethical and legal concepts with emphasis on biomedical issues.

Translational Challenges in Diagnostics, Devices and Therapeutics (3 Credits, new course)

This course covers a broad range of topics in the development and operation of medical diagnostics, devices, and therapeutics and combines lectures, readings, case studies, and class discussion. Biomedical Engineering and clinical faculty will discuss the challenges they encounter in their practice, and opportunities for advancing their fields by new inventions, and discoveries. Focus will be on existing and emerging biomedical technologies, in terms of their core physiology and engineering, and their societal and economic costs. Students will actively participate in organizing the lectures and discussing potential experimental solutions to these problems.

Intellectual property, Regulation and Quality Assurance (3 Credits, new course)

This course comprises the study of fundamental topics of intellectual property (IP), such as copyright and related rights, trademarks, and patents. Contemporary issues of the IP field, including unfair competition, enforcement of IP rights and emerging issues in IP are also discussed. FDA approval processes and Regulation of pharmaceutical drugs and medical devices will cover applicable laws and regulations in the strategic planning, development, manufacture and commercialization of health care products. These topics will be analyzed with a focus on safety, surveillance, business, law, and international procedures surrounding the regulations in the health care industry. Students will be prepared to work within regulatory and quality assurance constraints necessary for development of medical products, drug manufacturing, and clinical investigations.

Engineering, Entrepreneurship and Business Leadership (3 Credits, new course)

This course will compare the “Lean Start-up Method” that has come to dominate the high-tech and start-up worlds to traditional business planning approaches for launching new ventures. The Lean Start-up Method favors experimentation, customer feedback and iterative design over traditional business approaches that rely on big design and

planning and big design up front. Students will learn how to use a combination of business-hypothesis-driven experimentation, feedback and iterative product releases to speed product development cycles, understand capital market and risk, and strategies for product launches. Students will participate in comparison studies of start-up approaches versus traditional business planning models.

Clinical and Translational Research Methods (2 Credits, new course)

This course will provide an introduction to the processes used in clinical and translational research, defined broadly as patient-oriented, translational, epidemiologic, comparative effectiveness, behavioral, outcomes, or health services research (i.e., any research that has individual human beings or groups of human beings as its unit of observation). Students are exposed to overarching concepts and essential vocabulary for designing and interpreting clinical and translation research. This is primarily accomplished by instructing students in the creation of a research protocol, which is intended to address a relevant research question in their specific discipline.

Biomedical Ethics and Responsible Conduct of Research (1 Credit)

This course will introduce topic of integrity in biomedical and scientific research. The topics include scientific misconduct, ownership of data and discoveries, documentation, ethics of animal and human research, ethical challenges in the digital world.

II. REQUIRED COURSES: THE DESIGN PROCESS

BioDesign I: Need finding and screening (2 Credits, new course)

The first course of a three course sequence in which a year long group project will be undertaken to design and construct a biomedical engineering device or system. This first course emphasizes the identification of a need for a biomedical device/system/drug. Students will learn to perform a high-level assessment of the characteristics of the medical area in which a biomedical need should be identified. The course will include topics such as strategic focus, observation and problem identification, need statement development, disease state fundamentals and treatment options. This course must be taken at the same time as *BME I6200 - Cost analysis and the business of translation*

Cost analysis and the business of translation (1 Credit, new course)

This course focuses on business fundamentals inherent to translational product development, including R&D, market analysis, and business model projections. Selected devices will be used as case studies to illustrate the areas of cost considerations in the translational process and cost impact of new products and reimbursement strategies in context to the health care market and business environments.

BioDesign 2: Conceptual Innovation (3 Credits, new course)

The second course of a three course sequence in which a yearlong group project will be undertaken to design and construct a biomedical engineering device or system. This second course focuses on the development of a solution to the pharmaceutical, biotechnological, drug delivery or medical device need identified in the BioDesign 1 course, taking advantage of the creative group process and the power of computer design and prototyping to evaluate innovative conceptual solutions. The content of this course will include Ideation and Brainstorming, Concept Screening, Prototyping, and Final Concept Selection

BioDesign 3: Translational solutions (3 Credits, new course)

The third course of a three course sequence in which a yearlong group project will be undertaken to design and construct a biomedical engineering device or system. This third course focuses on the implementation of the conceptual design solution defined in BioDesign 2 course. The conceptual design and prototype will be transformed into a product that can be marketed and used at the bedside to treat patients. The content of this course will focus on final product development, testing and clinical validation methods as well as preparation of documents for regulatory submission. Students will learn to develop a translational solution to a biomedical need within the constraints of a real world problem including quality and process management, reimbursement strategy, marketing and stakeholder strategy, sales and distribution strategy, competitive advantage and business strategy, operating plan and financial model, business plan development, funding sources, and licensing and alternate pathways

III. ELECTIVES COURSES (minimum 6 credits)

Chosen from:

- All graduate courses in Biomedical Engineering, including maximum of one eligible 400 and 500 level courses (see list)
- Selected graduate courses in Chemical Engineering, Electrical Engineering and Computer Engineering (optics, photonics, control systems) including maximum of one eligible 400 and 500 level (List under development)
- Special topics in Sophie Davis in applied pharmacotherapeutics, pharmaceutical engineering and neuroscience.
- Graduate courses at NYCBE medical school partners, by permission of MTM advisor

SAMPLE LIST OF CURRENT POTENTIAL TECHNICAL ELECTIVES

Notes: Pre-requisites for all elective courses are as described in CCNY course bulletins. All courses are 3 credits unless otherwise indicated.

Biomedical Engineering (BME) Electives

BME I2000: Cell and Tissue Engineering

The course covers the underlying mechanisms of cell/tissue fate processes and their interaction with biomaterials as well as how to study them quantitatively using engineering methods. Students will gain knowledge of current products of bioartificial organs in research, clinical trials and industry, their limitations and prospects. The course will prepare students with the ability to identify challenges in the field of tissue engineering and provide feasible solutions through the writing of term papers in the format of a research proposal.

BME I2200: Cell and Tissue Transport

The course will start with an analysis of water, solute, gas, and heat exchange in the microcirculation and the relationship between structure and function. Active transport across membranes will be considered and applied to the kidney and secretory organs. Transport in biological porous media will be examined and applied to bone, cartilage, and arterial wall. An introduction to receptors and their role in transport, cell adhesion, and intracellular signaling will be presented. The course will conclude with student presentations on topics of current interest.

BME I3000: Neural Engineering and Applied Bioelectricity

An overview of the field of neural engineering including neuronal biophysics, synaptic and non-synaptic communication, electrophysiological techniques, field potential and current source density analysis. The course introduces fundamentals of applied bioelectricity/electrical prosthetic (FES) including electric field neuronal interactions and electrocution hazards.

BME I4200: Organ Transport and Pharmacokinetics

Application of basic transport principles (conservation of mass and momentum equations) to major animal and human organ systems. Topics include mechanisms of regulation and homeostasis, anatomical, physiological, and pathological features of the cerebral, respiratory, renal, cutaneous and gastrointestinal systems. Basic concepts in pharmacokinetic analysis for drug administration are also discussed. Related and recent research articles will be discussed. Students will be guided to write up a proposal regarding a current topic.

BME I4300: Physiology for Biomedical Engineers (6 credits)

This course is designed to provide biomedical engineering students with a comprehensive understanding of the principles of human physiology. It covers a broad range of topics, from cellular physiology to the physiology of organs and organ systems. The course includes units devoted to the study of membrane solute transport, nerve and muscle

functions, functions of the autonomic nervous system, cardiovascular system as well as renal, respiratory, gastrointestinal and endocrine systems. Instructional activities include lectures, case presentations, laboratories and special conferences.

BME I5000: Medical Imaging and Image Processing

This course introduces basic medical imaging methods such as computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography (PET). Students will gain understanding in the basic physics of image acquisition and the algorithms required for image generation. Basic image enhancement, and image analysis will be presented in the context of X-ray imaging and microscopy. The course will include linear systems, random variables, and estimation theory. Students will gain hands-on experience in image processing through MATLAB programming in class

BME I5100: Biomedical Signal Processing

This course introduces two fundamental concepts of signal processing: linear systems and stochastic processes. Various estimation, detection and filtering methods are developed and demonstrated on biomedical signals. The methods include harmonic analysis, autoregressive model, Wiener and Matched filters, linear discriminates, and independent components. All methods will be developed to answer concrete questions on specific data sets such as electrocardiograms, electroencephalography, acoustic signals, or neural spike trains. The lectures will be accompanied by data analysis assignments using MATLAB.

BME G6000: Advanced Biomaterials

This course is concerned with the design and fabrication of advanced biomaterials for clinical applications. The major classes of materials and characterization methods are presented to provide a foundation for more specialized topics focusing on novel materials with tailored structural and biological properties to facilitate interactions with living tissue. Topics to be discussed include surface modification to engineer cell-instructive materials, self-assembled and nanostructured materials, hybrid composite materials, environmentally responsive "smart" biomaterials, and decellularized natural matrices.

BME I7000: Laboratory in Cellular and Molecular Engineering

The course covers current biotechnologies used in molecular, cell and tissue engineering research labs as well as biotech industries through lectures and hands-on labs. There are four modules: (1) cell processing, basic microscopy & tissue engineering, (2) gene manipulation and genetic engineering, (3) advanced microscopy and fluorescent probes, and (4) probing biocomplexity and protein analysis. The students are required to design their own experimental methods to solve the given biomedical problems according to the basic protocols in manuals/books/papers provided by the instructor.

BME I7300: Cell and Tissue–Biomaterial Interactions

This course is concerned with the reaction and interaction of both inert and bioactive foreign materials placed in the living human body. Topics to be discussed include atomic structure and bulk properties of the major classes of implantable materials;

biocompatibility; characterization of non-living biomaterials; reaction of biological molecules with biomaterial surfaces; host response to implants; hemocompatibility; effects of degradation on implant materials; bioactive surfaces; resorbable implant materials; standardization, sterilization and regulation of implant materials; in vitro and in vivo biomaterial testing methods; and introduction to tissue engineering. Case studies and presentations of current literature focusing on novel materials and new clinical applications will also be included to identify future directions in biomaterials research.

BME I7700: Microfluidic Devices in Biotechnology

Fundamentals of modern microfluidic devices with applications to biomedical measurements, e.g., electrophoretic systems, flow cytometers, and immunoassays. Review of fundamental properties of microfluidic systems including the effects of fluid mechanics, heat transfer, and electromagnetic phenomena on biological systems. Theory of Navier-Stokes, Nerst-Planck and convection transfer equations will be discussed. Critical overview of design, manufacture, and operation of micrometer scale systems that use photolithographic and surface treatment techniques for device development. Special projects will also be used to analyze biomedical inventions on the horizon.

BME I8000: Bone Physiology and Biomechanics

This course is concerned with the normal mechanical and biological functions of bone, as well as the clinical problems in metabolic bone disease and orthopaedic treatment. Specific topics will examine how bone cells produce matrix material and structure, restructure it during life to optimize bone mechanical function, and then maintain the material vs. structural properties throughout life. Bone organ, tissue and cellular, molecular level processes will be examined as integrated hierarchical systems contributing to mechanical function, presented from lectures, case studies and presentations of critical literature identifying central principles in bone biomechanics. Discussions will identify directions for future research and translational development.

BME I9000: Skeletal Soft Tissue Physiology and Biomechanics

This course is concerned with the physiology and biomechanics of the skeletal soft tissues (cartilage, tendon, ligament, intervertebral disc). The course will examine how specialized connective tissue cells produce their matrices and organize them hierarchically into tissues with unique mechanical properties. How tissue and biomechanical properties of the various skeletal soft tissues are maintained in life or fail in skeletal diseases will also be examined. Case studies will be used to identify directions for future research and translational development.

BME 405: Biomedical Transducers and Instrumentation (approved undergraduate)

Basic principles of biomedical electronics and measurements including sensors, transducers, amplifiers, filters, data acquisition and analysis, signal to-noise ratio, artifacts; display of biological data using digital computers; design and analysis of biomedical instrumentation; laboratory applications of digital signal processing and real-time analysis of physiological signal

BME 520: Practical Tools for Medical Device Design (approved undergraduate)

This course provides training in the systematic design, fabrication, testing, and documentation process required for commercial development of medical devices. Two devices related to cancer treatment, one diagnostic and other therapeutic, will be used as semester-long case studies to illustrate the development process to students. The course will be based on an apprentice model, and project kits will be provided to the students that will help them in performing course work. Topics covered include introduction to product development life cycle, FDA regulated design documentation activities, concept generation and evaluation, computer-aided device design, design review process, design for manufacturing, bio-safe material selection, manufacturing processes available for medical device fabrication, testing methods, documentation for regulatory submission

Chemical Engineering (ChE) Electives

ChE 1900: Bioprocess Engineering: Mammalian Cell Biotechnology

Basics of biochemistry and cell structure with emphasis on eucaryotic cells. Introduction to recombinant DNA technology and protein engineering. Introduction to cell culture bioreactors. Production of glycosylated proteins. Biochemical engineering aspects of stem cells.

ChE 512: Pharmaceutical Applications of Chemical Engineering (approved undergraduate)

Topics in controlled drug delivery: design of devices, commercial successes and failures, mechanisms of release devices as well as relevant background in mass transfer, structure and design of materials, electrical devices, and pharmacokinetics are also addressed.

ChE 580: Bioprocess Engineering (approved undergraduate)

Introduction to the production of chemicals by microorganisms. Basics of biochemistry and cell structure with emphasis on prokaryotic microbes. Enzymes and their biotechnological uses. Introduction to recombinant DNA technology and genomics. Operation, design and scale-up of bioreactors. Selection, design and scale-up of separation and purification equipment. Safety considerations.

APPENDIX B SYLLABI FOR NEW COURSES

APPENDIX C PROGRAM REQUIREMENTS (SED form)

APPENDIX D: SAMPLE PROGRAM SCHEDULING (SED Form)

APPENDIX E FACULTY TEACHING ASSIGNMENTS

APPENDIX F PROJECTED EXPENDITURES (SED Form)

APPENDIX G PROJECTED REVENUE (SED Form)

APPENDIX H CAPITAL EXPENDITURE (SED Form, N/A)

APPENDIX I BYLAWS

BYLAWS OF THE FACULTY SENATE
THE CITY COLLEGE
of
THE CITY UNIVERSITY OF NEW YORK

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Bylaws revisions Phase 1 proposed to the Faculty Senate: April 24, 2014

Bylaws revisions Phase 1 approved by the Faculty Senate: November 20, 2014

Mark up for review of proposed revisions, Phase 2: December 2, 2014, rev. 12-10-2014

Mark up for review of proposed revisions, Phase 3: TBA

Date in effect: March 1, 2015

BYLAWS OF THE FACULTY SENATE

NOTES

1. All titles within the Bylaws of the Faculty Senate refer to the current organizational structure. It is to be understood that if a position takes on a new title, it is to be the new title, which is to fill the appropriate role.
2. When ~~Chairman~~ **Chair** or other such title is used, it is not to be understood as a designation of gender but a convenient shorthand term.

ARTICLE I POWERS AND FUNCTIONS

- Section 1. The Faculty Senate shall be the authentic voice of the Faculty of The City College of the City University of New York in all matters concerned with policies, operations, planning and problems of college-wide import.
- Section 2. The Faculty Senate shall have the power, under the City University of New York (CUNY h/a) Board of Trustees, to consider and make decisions in all college-wide matters including:
- a. the academic status, role, rights and obligations and freedoms of the faculty;
 - b. the allocations of resources for educational objectives; for research and scholarly activities, and for the development and maintenance of the physical plant of the College;
 - c. student activities;
 - d. the appointment and retention of the principal administrative officers at the College level;
 - e. the establishment and location of new units of the College and the appointment of principal administrative officers thereof;
 - f. the Faculty responsibilities (*i.e.*, admissions policy, retention standards, credits, curriculum and degree requirements, the granting of degrees, and personnel matters) for inter-School or College-wide Centers, Programs and Institutes **that** are not wholly within the purview of the Curriculum Committees or Faculties of the various Schools;
 - g. the relations between the College and the local community, and between the College and governmental units and agencies;
 - h. the general public relations of the College.
- Section 3. Decisions reached by the Faculty Senate shall not be reversed by the President or the CUNY Board of Trustees except in circumstances and for reasons promptly communicated to the Senate. Following such communication, the Faculty Senate shall have the opportunity for further consideration and transmittal of its views to the President or to the CUNY Board of Trustees.
- Section 4. The Faculty Senate and its committees shall be fully advised, shall routinely receive, and shall be free to seek information from students and student organizations, faculty members and Departments, Schools and Divisions, the Review Committee, officers of administration, and such other sources as may be appropriate, such as the Council of Presidents, on all matters germane to the programs and operations of the College. It may address communications to the CUNY Board of Trustees, which on

being submitted to the President of the College, shall be forwarded, together with his or her comments thereon, by the President without delay to the CUNY Board of Trustees.

- Section 5. The Faculty Senate shall initiate policy recommendations, shall review and comment upon changes in policy initiated by the College administration, the Council of Presidents and the CUNY Board of Trustees, and shall routinely present faculty views to the President before, as, and after matters of policy are considered and decided.
- Section 6. The Faculty Senate shall not assume the prerogatives and powers appropriate to the several Faculties of the constituent Schools and of the College of Liberal Arts and Science. Decisions within each school as to matters of curriculum and instructions are reserved to these Faculties, and decisions as to the academic standing and progress of students and the conferring of degrees rest with these several Faculties, subject only to the CUNY Board of Trustees. The Faculty Senate may pass such matters in review before its appropriate committees or in plenary session; but it may not infringe upon the powers explicitly reserved to the several academic Faculties. In this regard, questions of jurisdiction shall be resolved by the President on recommendation of the Provost.
- Section 7. In the event of disagreement between the Senate and either the College administration or the CUNY Board of Trustees, the Senate shall elect a committee to meet with the administration or the Board to present the position of the Senate on the question and to report to the Senate for appropriate action.

ARTICLE II

MEMBERSHIP AND ELECTIONS

Section 1. Members

The Faculty Senate shall be composed of:

- a. Senators and Alternates who shall be persons of faculty rank elected at large from each ~~department school~~ or other constituency as specified in Section 2, Nominations and Elections.
- b. The following members *ex officio*, without vote: The President, the Provost, the Vice Presidents, the Associate Provosts, all full **Deans**, the Registrar, the Director of Admissions and Records, the Chief Librarian and the Ombuds. Also: five members of the Executive Committee of the Undergraduate Senate and two members of the Executive Committee of the Graduate Council.
- c. At any time the Faculty Senate may modify its *ex officio*, non-voting membership by a two-thirds vote of the membership of the **Senate**.

Section 2. Nominations and Elections

- a. Each department may nominate persons of faculty rank.
- b. Any person of faculty rank may be nominated by a petition signed by **30 percent of persons of faculty rank in his or her department or constituency up to a maximum of ten signatures**. He or she must indicate in writing his or her willingness to serve as a Senator or Alternate.
- c. Senators and Alternates shall be elected by persons of faculty rank in **all departments of** the following constituencies:
 - Division of Humanities and the Arts, CLAS
 - Division of Science, CLAS
 - Colin Powell School for Civic and Global Leadership (**formerly** Division of Social Science), CLAS
 - Department of SEEK Counseling and Student **Support** Services, CLAS
 - Division of Interdisciplinary Studies at the Center for Worker Education, CLAS
 - Bernard and Anne Spitzer School of Architecture
 - Grove School of Engineering
 - School of Education
 - Sophie Davis School of Biomedical Education
 - Library Department
- ~~d. Any Center, Program or Institute, or College-wide department which has been ten or more full-time persons of faculty rank assigned to it shall be considered a School for the purpose of electing representatives to the Faculty Senate.~~

- ~~e.~~ Full-time members of faculty rank who are members of Centers, Programs or Institutes, who are themselves not represented by the above provisions, shall collectively elect a senator or senators but do not belong to a department, are entitled to representation in the Senate according to consonant with the formula below.
- d. ~~f.~~ The number of Senators shall be determined annually on February 15th in accordance with this a-formula that would yield the following representation if elections were to be made by departments among their own members:

<u>(Full-time faculty rank, including the Chair)</u>	<u>Number of Senators</u>
1 - 10	1
11 - 25	2
26 - 50	3
51 and over	4

- e. ~~g.~~ Within each constituency, the candidate who receives the most votes without being elected a Senator shall be designated an Alternate. An Alternate shall vote in the absence of a regular member from his or her constituency. **If there is no runner up to the election, then the department will elect or designate an Alternate and inform the Senate office of the result.**
- f. ~~h.~~ Any Senator or Alternate elected from a particular constituency retains that seat for the duration of the term for which he/she was elected ~~independent~~ **regardless** of any **subsequent** change in the number of representatives from that constituency. However, if the constituency is abolished by transfer of all or some of its members to other constituencies already represented in the Senate, that Senator's seat shall be abolished at the end of the academic year in which this change occurs.
- g. ~~i.~~ The Elections Committee shall designate each year a period between March 1 and April 10 in which nominations shall be held.
- h. ~~j.~~ Elections shall be held **at least** two weeks after the nominations are closed and must be completed before the May meeting of the Faculty Senate.
- k. ~~Senators shall be elected by the Hare system of proportional Representation applied separately to each constituency.~~

Section 3.

Senatorial Tenure

- a. Senators and Alternates shall be elected for a term of three years. ~~The seats shall be allocated so that one third of the senate will be elected each year.~~
- b. The term of office of an elected **Senator** shall commence with **the Reorganization Meeting** and shall terminate with the close of the **Plenary** ~~regular~~ meeting in May.
- c. ~~A vacancy in an unexpired term shall be filled by the Alternate for that division, whose vacancy shall in turn be filled by the person who, in the same constituency as the vacating senator, received the highest number of votes, provided that this is more than half of the quota (number of votes required to elect candidates) which was used in the preceding election. In the event that no one received such a number of votes, the Committee on Nominations shall announce to the constituency that a vacancy exists. The Committee shall then bring to the senate the name(s) of a candidate or candidates from the same~~

constituency. Further nominations may be made from the floor by members of the said constituency. The Senate shall elect a replacement who will serve for the remainder of the vacancy or until the next election, whichever comes first. Vacancies for Alternates will be handled in the same way. ~~Should a Senator be unable to complete his or her term, the Alternate will replace him or her, having been selected according to the method described in Section 2-e. Should no Alternate be available, nominations will be solicited from the constituency and also taken at the next Plenary meeting, and the Senate will elect a replacement to complete the remainder of the term. Should the department fail to designate an Alternate, the seat will remain vacant for the duration of the Senator's term.~~

- d. A Senator who goes on leave may choose to continue Senate participation during the term of leave. ~~The Senator must by indicating that choice in writing to the Chair Secretary of the Senate prior to the commencement of the leave. An Alternate shall be named through made by the methods specified in Subsection c, above.~~
- e. ~~A Senator is expected to make every effort to attend each Plenary meeting. After a Senator has two consecutive absences, the Senate office will notify that Senator's constituency and it will decide upon the best course of action. The seat of a Senator who is absent without excuse for two consecutive regular meetings of the Faculty Senate shall be declared vacant by the Executive Committee and an interim successor shall be selected by the above method.~~
- f. A Senator who has a class, a laboratory section, or other regularly scheduled obligation between the hours of 2:00 p.m. and 4:00 6:00 p.m. on the regularly scheduled Senate meeting days of the third Thursdays of September, October, November, December, February, March, April or May, shall be considered on leave for the semester or remainder thereof, unless an exemption is granted for the Senator by the Executive Committee for that semester or the remainder thereof.

Section 4.

Elections Appeals

- a. Appeals should be filed in writing with the Senate Affairs Committee. An appeal of decision of the Senate Affairs Committee may be made to the Faculty Senate Executive Committee. An appeal of the Faculty Senate Executive Committee decision may be made to the Faculty Senate.
- b. Every effort shall be made to file an appeal in a timely manner so as not to disrupt the business of the Faculty Senate.
- c. Every effort shall be made to provide written documentation supporting the concerns stated in the appeal.

ARTICLE III OFFICERS

Section 1. Presiding Officer

- a. The ~~Chairman~~ of the Executive Committee, or the ~~Chairman~~'s designee, shall preside over meetings of the Senate.

Section 2. Secretary

- a. There shall be a Secretary of the Senate who shall be elected from the Senate by majority vote at the annual **Reorganization Meeting**. His or her term of office shall be one year.
- b. The Secretary shall serve as a member of the Executive Committee, ex officio and without vote, unless elected to the Executive Committee.
- c. The Secretary **or his or her designee** shall be responsible for taking minutes of each meeting. ~~and for their distribution.~~
- d. The ~~Secretary~~ **Senate office** shall also be responsible for keeping all records of business or communications, and the preparation and distribution of all materials received by the **Senate**.
- e. If the Secretary is absent, the Presiding Officer shall appoint a Secretary pro tempore.

Section 3. Treasurer

- a. The Treasurer of the Senate shall be elected by majority vote at the annual **Reorganization Meeting**. His or her term of office shall be one year.
- b. A Senator **may not** be elected as Treasurer for more than three successive terms.
- c. The Treasurer shall receive and disburse all Senate funds and maintain appropriate records of all income and expenditure. He **or she** shall prepare a financial report for each regular meeting and shall submit a complete financial statement to the **Senate** at the last regular meeting of the academic year.
- d. The Treasurer shall be responsible for preparing a proposed annual Senate budget for submission to the Executive Committee.

~~Section 4. Sergeant at Arms~~

- ~~a. There shall be a Sergeant at Arms of the Senate who shall be elected by majority vote at the annual reorganization meeting. His or her term of office shall be one year.~~
- ~~b. The Sergeant at Arms shall assist the Presiding Officer in the maintenance of an orderly meeting.~~

Section 4. Nominations for **the Executive Committee, the Secretary, and the Treasurer** shall be made from the floor at the **annual Reorganization Meeting** in May. **The Provost of the College shall preside over the Reorganization Meeting of the Faculty Senate.**

Section 5. The Presiding Officer shall appoint a Senator to act as Parliamentarian.

Section 6. The term of office for all elected and appointed officers is one year commencing with the **Reorganization Meeting** and extending through the regular meeting the following May.

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ARTICLE IV SENATE COMMITTEES

SECTION B. DUTIES and COMPOSITION OF COMMITTEES

1. EXECUTIVE COMMITTEE

I. Duties

- a. Shall transact such business of the Senate as may be necessary between meetings.
 1. Any action taken by the Executive Committee during a period when the Senate cannot be convened (a) shall require a majority vote of the members of the Committee; (b) shall be reported to the Senate at its next meeting.
- b. Shall remain on call during its entire term in office.
- c. Shall prepare an Agenda for all meetings of the Senate.
- d. Shall keep minutes of its meetings and shall report its actions regularly to the Senate.
- e. Shall notify the members of the Senate of the time and place of all special meetings.
- f. Shall review and coordinate the structure and activities of the committees of the Senate.
- g. Shall sit on the President's Policy Council.
- h. With consent of the Senate, shall select the faculty members of ad hoc committees appointed to advise with the President in the selection of Directors for College-wide Centers, Programs, Institutes and similar offices.
- i. Shall prepare and distribute an annual report.
- j. Upon authorization by the Senate, the Executive Committee shall be responsible for
 1. Implementing the policies of the Senate;
 2. Hiring and assigning staff for Senate functions;
 3. Disbursing budgeted and other funds;
 4. Retaining counsel;
 5. Exercising such further powers and duties as may be conferred upon it by the Senate.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES and COMPOSITION OF COMMITTEES

1. EXECUTIVE COMMITTEE

II. Chairman of the Executive Committee

- a. Shall preside over meetings of the Senate.
 1. Shall designate another member of the Senate to preside in his or her absence.
- b. Shall convene and chair meetings of the Executive Committee.
- c. Shall be a member ex officio, without vote, of all Senate committees other than the Executive Committee.
- d. Shall sit on the Review Committee.
- e. Shall sit on the Faculty Committee on Personnel Matters.
- f. Shall serve as chairman of the Executive Council.
- g. Shall carry out all other responsibilities appropriate to the office of the chairman.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

1. EXECUTIVE COMMITTEE

III. Composition

- a. Shall be composed of seven senators. Alternates are not eligible to serve on the Executive Committee.
- b. The Secretary of the Faculty Senate and the Faculty Ombudsman shall serve as members of the Executive Committee ex officio without vote.
- c. Members of the Executive Committee shall be elected for a term of one year at the Reorganization Meeting of the Senate in May.
- d. Members of the Executive Committee shall be elected as follows:
 1. Nominations shall be made from the floor.
 2. Names of Senators not present at the Reorganization Meeting may be placed in nomination provided the nominees give written consent.
 3. Nominations shall remain open until no member wishes to place a name in nomination.
 4. Upon the close of nominations, each candidate, or his or her designee, may speak for no more than two minutes.
 5. The election shall be by preferential ballot. Each senator shall number his or her preferences in descending order, using for his or her first choice the highest figure of the number of vacancies to be filled (e.g., 4 to 1, or 3 to 1). Only ballots marked for the number of preferences equal to the number vacancies shall be counted. Senators receiving the highest totals shall be declared elected.
- e. The Executive Committee shall elect from among its members a chairman who shall serve for the term of one year.
- f. The Executive Committee shall elect its own Secretary.
- g. A quorum shall consist of the majority of the total number of voting members that the Executive Committee would have were there no vacancies.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES and COMPOSITION OF COMMITTEES

2. EDUCATIONAL POLICY COMMITTEE

I. Duties

- a. Shall consider and make recommendations to the faculty on questions of educational policy which are not wholly within the purview of the Faculties or Faculty Councils of the various Schools. Such questions shall include the creation and approval of new Schools or new Centers, Programs or Institutes involving more than one School, or likely to have impact on College resources.
- b. Reports and recommendations emanating from this committee shall be brought before the Faculty Senate and, as approved or modified by the Senate, be referred to the Provost for appropriate action.
- c. Shall oversee the activities of the Auxiliary Committee on the Library.

II. Composition

- a. Shall be composed of:
 1. A faculty representative elected from each of Curriculum Committees of the several Schools.
 2. Five members of the Faculty Senate;
 3. Two undergraduate students appointed by the Undergraduate Senate, ex officio, without vote;
 4. One graduate student appointed by the Graduate Student Association, ex officio, without vote;
 5. The Provost, ex officio, without vote;
 6. The Senior Associate Provost of Academic Affairs, ex officio, without vote;
 7. The chairman of the Executive Committee of the Faculty Senate, ex officio, without vote.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES and COMMITTEES

2.A. LIBRARY COMMITTEE

I. Duties

- a. Shall advise the Chief Librarian on matters concerning the operation of the Library.
- b. Shall review policies and procedures pertaining to the operation of the Library, and shall make recommendations to the Senate as it deems advisable.

II. Composition

- a. Shall be composed of:
 1. One Senator, who shall be chairman;
 2. The Chairmen of the Library Committees of the several Schools of the College;
 3. Two librarians elected by the Library staff;
 4. One undergraduate student elected by the Undergraduate Senate;
 5. One graduate student elected by the Graduate Student Association;
 6. The Chief Librarian, ex officio, without vote.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

3. COLLEGE-WIDE RESOURCES COMMITTEE

I. Duties

- a. Shall keep in review the areas of the College involving administrative affairs and institutional resources.
- b. Shall participate in the creation of the tentative budget by the President for the Chancellor.
- c. Shall participate in planning for the allocation of the actual budget when it is received.
- d. Shall participate in the formulation of the long-range economic policies of the College.
- e. Shall oversee the activities of the Auxiliary Committee on Physical Plant, the Auxiliary Committee on Research, and the Auxiliary Committee on Campus Security.
- f. Shall appoint and oversee additional Auxiliary Committees when they are needed to deal with other areas within the category of Institutional Resources.

II. Composition

- a. Shall be composed of:
 1. Six members of the faculty;
 2. The Chairmen of the auxiliary committees;
 3. The Vice President of Finance ex officio, without vote.

Auxiliary Committees shall be numbered as follows:

- 3.A. Physical Plant Committee
- 3.B. Research Committee
- 3.C. Campus Security Committee
- 3.D. Institutional Research Committee
- 3.E. Financial Planning Committee

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

3.A. PHYSICAL PLANT COMMITTEE

I. Duties

- a. Shall confer with and receive reports from the Campus Facilities Officer.
- b. Shall review plans for changes in structure, space allotment and space assignment.

II. Composition

- a. Shall be composed of seven members of the faculty.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

3.B. RESEARCH COMMITTEE

I. Duties

- a. Shall review applications for and allot research funds to members of instructional staff.
- b. Shall confer with and receive reports from the City College Fund and the Research Foundation.

II. Composition

- a. Shall be composed of seven members.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

3.C. CAMPUS SECURITY COMMITTEE

I. Duties

- a. Shall keep under continuous review all measures to maintain the security of persons and property on the campus of the City College and to make recommendations to this end to the appropriate authorities.

II. Composition

- a. Shall be composed of:
 1. Six members of the faculty;
 2. Two undergraduate student members chosen by the Undergraduate Senate;
 3. One graduate student member chosen by the Graduate Student Association;
 4. The Director of Public Safety, ex officio, without vote
 5. The Senior Associate Provost of Academic Affairs, ex officio, without vote;
 6. The Vice President for Student Affairs, or his or her designated representative ex officio, without vote;
 7. The Vice President of Finance, ex officio, without vote.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

3.D. INSTITUTIONAL RESEARCH COMMITTEE

I. Duties

- a. Shall confer with and receive reports from the Director of the Office of Institutional Research on matters concerning the operation of the Office.
- b. Shall review policies, programs and priorities of the Office of Institutional Research and make such recommendations to the Senate Committee on College-Wide Resources as it deems advisable.

II. Composition

- a. Five members of the faculty;
- b. The Director of the Office of Institutional Research, ex officio, without vote;
- c. The Vice President of Finance, ex-officio, without vote.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

3.E. FINANCIAL PLANNING COMMITTEE

I. Duties

- a. Shall participate in the creation of the tentative budget by the President for the Chancellor.
- b. Shall participate in planning for the allocation of the actual budget when it is received.
- c. Shall participate in the formulation of the long-range economic policies of the College.
- d. Shall oversee the activities of the Auxiliary Committee on Campus Security.

II Composition

- a. Shall consist of seven members of the Faculty.
- b. The Vice President of Finance and one member of the Executive Committee of the Faculty Senate shall be members ex officio, without vote.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

4. Student Affairs Committee

I. Duties

- a. Shall keep in review the area of the College classified in the administrative category of student affairs.
- b. Shall keep under continuous review the standards and conditions of extra-curricular activities as well as regulations affecting freedom of expression and student conduct.
- c. Shall establish structures and procedures, and codify rules and regulations governing conduct and shall be responsible for continual review of the effectiveness of structures, procedures rules, and regulations. All structures, procedures and codes developed shall take effect when approved by the Faculty Senate, and Undergraduate Senate and the Graduate Student Association. (In the event of disagreement, the procedure described in Article XII of the Governance Charter shall be followed.)
- d. Shall appoint and oversee additional Auxiliary Committees when they are needed to deal with other areas within the category of Student Affairs.
- e. Shall appoint all faculty members of its auxiliary committees, except where otherwise provided in these bylaws, for staggered three-year terms.
- f. Shall make interim appointments of student members to its auxiliary committees where such student members have not yet been designated by the appropriate regular procedures.
- g. When the Student Affairs Committee has made interim appointments of student members to its auxiliary committees, it shall notify the officers of the Student Senate of these appointments.
- h. For the purpose of appointing members to its auxiliary committees, a quorum of the Student Affairs Committee shall consist of a majority of its members eligible to vote at the time such action is taken.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

4. Student Affairs Committee

II. Composition

a. Shall be composed of:

1. Five members of the Faculty;
2. One undergraduate student selected by the Undergraduate Senate;
3. One graduate student selected by the Graduate student Association;
4. One student selected by the Undergraduate Student Senate;
5. The chairmen of the auxiliary committees; ex officiiis, without vote;
6. The Vice President for Student Affairs, ex officio, without vote;
7. One member of the Senate Executive Committee, ex officio, without vote;

The chairmen of the auxiliary committees need not be members of the Faculty Senate.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

5. FACULTY STUDENT COMMITTEE ON INTERCOLLEGIATE ATHLETICS

I. Duties

- a. Shall initiate policy and procedures concerning the conduct of intercollegiate athletics at the City College, subject to the approval of the Faculty Senate.
- b. Shall have authority to implement routine matters of policy and procedure approved by the Faculty Senate.
- c. Shall prepare and report on the annual budget which shall be sent for consideration and final decision to both the Faculty Senate and the Undergraduate Senate after consultation with the Vice Provost for Student Affairs. (In the event of any disagreement, the procedure described in Article XII of the Governance Charter shall be followed.)

II. Composition

- a. Shall be composed of:
 1. Two members of the faculty, including at least one Senator.
 2. Three undergraduate students elected by the Undergraduate Senate.
 3. The Chairman of the Department of Physical and Health Education.
 4. The following ex officiiis, without vote:
 - a. The Vice President for Student Affairs;
 - b. The Vice President of Finance;
 - c. The Director of Athletics;
 - d. The Business Manager;
 - e. A representative of the CCNY Alumni-Varsity Association, to be selected by the CCNY Alumni-Varsity Association.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEE

6. FACULTY-STUDENT DISCIPLINE COMMITTEE

I. Duties

- a. Shall hear cases and shall make decisions in accordance with Article 15 of the Bylaws of the CUNY Board of Trustees.

II. Composition and Functions

- a. Shall be composed of:
 1. Three members selected by lot from a panel of six faculty members;
 2. Three members selected by lot from a panel of six students;
 3. A chairman selected by the six members of the committee from among the remaining members of the panel.
- b. The Chairman shall have the power to vote in case of a tie.
- c. Shall have a quorum of at least two faculty members and two student members.
- d. A panel of six faculty members (with faculty rank) shall be elected at the first regular meeting of the Senate in September.
- e. A panel of six students shall be elected annually at large by students registered at the College.
- f. No member of the committee shall serve for more than two consecutive terms of office.
- g. In case a member chosen by lot resigns or is unable to complete his or her term of office, a replacement shall be selected by lot from the non-seated persons on the appropriate panel.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

7. ADMINISTRATION COMMITTEE

I. Duties

- a. Shall review the administrative structure and operation of the College.
- b. Shall be consulted on the creation of new college-wide administrative programs, titles or procedures, and the consolidation, modification or deletion of existing ones.
- c. Shall establish liaison with new College-wide administrative programs as they are formed and, when necessary, suggest the creation of an appropriate Senate Committee.
- d. Shall evaluate the performance of administrative personnel. e.

Shall make regular reports to the President and to the Senate on administrative programs, procedures and personnel.

II. Composition

- a. Shall consist of seven members of the Faculty.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION

8. INSTITUTIONAL RESOURCES ADVISORY COMMITTEE

I. Duties

- a. Shall maintain liaison with the administration's Institutional Resources Committee.
- b. Shall assure that faculty input on policy governing institutional resources shall be provided through appropriate channels, and review the implementation of these policies by the Institutional Resources Committee.
- c. Shall receive the bi-weekly minutes of the Institutional Resources Committee.
- d. Shall meet at least twice a semester with the Institutional Resources Committee.
- e. Shall report to the Senate at least once each semester.
- f. In the event that the functions relative to the utilization of college resources, presently performed by the Institutional Resources Committee, are subsequently handled by another body or bodies, this committee of the Senate shall continue its advisory relationship with such body or bodies.

II. Composition

- a. Shall be composed of the Chairmen of the Faculty Senate Executive Committee, the Educational Policy Committee, the Financial Planning Committee, the College-wide Resources Committee, and the Administration Committee.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

9. ACADEMIC FREEDOM and FACULTY INTERESTS COMMITTEE

I. Duties

- a. Shall investigate allegations of incidents affecting academic freedom and shall make such recommendations to the Senate as it deems appropriate.
- b. Shall keep under continuous review all matters concerning academic freedom, and when appropriate, shall recommend to the Senate such action as it considers desirable.
- c. Shall keep under continuous review such matters as teaching schedules, class sizes, research facilities, and similar questions of faculty concern and when appropriate, shall recommend to the Senate such action as it considers desirable.

II. Composition

- a. Shall consist of seven members.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

10. COMMUNITY RELATIONS COMMITTEE

I. Duties

- a. Shall recommend policies to guide the College in fulfilling its responsibilities in community relations.
- b. Shall recommend policies which will increase the College's ability to provide educational programs and extension services beyond those offered to the regular student body.
- c. Shall review and analyze the entire College's community-oriented activities and efforts.
- d. Shall recommend means of improving communication between community groups and the faculty.
- e. Shall recommend procedures for the most effective implementation and coordination of the College's activities and programs in the above areas.
- f. Shall receive request for community service which might be met by the College, and refer these to the appropriate body for action.
- g. Shall meet with such Community Advisory Committees as the President may establish under Article XIII of the Governance Charter.

II. Composition

- a. Shall be composed of:
 1. Seven members of the faculty elected by the Faculty Senate.
 2. Two undergraduate students appointed by the Undergraduate Senate;
 3. One graduate student appointed by the Graduate Student Association;
 4. The Vice President for Communications and Public Affairs, Ex officio, without vote.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

11. SENATE AFFAIRS COMMITTEE

- § A. Bylaws Committee
- B. Elections Committee
- C. Nominations Committee

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

11.A.. BYLAWS COMMITTEE

I. Duties

- a. Shall constantly review and update the Bylaws of the Faculty Senate.
- b. Shall be empowered to make automatic editorial changes in the Bylaws when those changes are of the following nature:
 - 1. where a new title is given to an ex-officio member of the Faculty Senate and any changes accompanying that title have no substantive bearing on the work of the Senate, the title of that position in the Bylaws conferring ex-officio membership shall be corrected accordingly. The Committee shall inform the Senate of such a change.
 - 2. where a change in the name of any division, school, department, center, program or institute, or college-wide department which has ten or more full-time persons of faculty rank assigned to it does not involve any governance change, the Bylaws Committee shall update the Bylaws accordingly and inform the Faculty Senate.
 - 3. when a department ceases to exist at the College the Bylaws Committee will strike all references to it in the Bylaws and inform the Senate of those deletions.

II. Composition

- a. Shall consist of seven senators.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMMITTEES

11.B. ELECTIONS COMMITTEE

I. Duties

- a. Shall take full and complete charge of the nominations and elections to the Senate and to the Office of the Ombuds.
- b. Shall circulate notices concerning the nomination and election of Senators and of the Ombuds.
- c. Shall certify to the Senate, at the May meeting, the names of elected Senators and of the Ombuds.
- d. Shall hear and decide upon complaints and appeals pertaining to elections under its jurisdiction. Appeals from decisions of the Committee can be made to the Faculty Senate Executive committee. Final appeals can be made to the Faculty Senate.
- e. The Committee may, at its discretion, conduct other elections, upon request, on behalf of other instructional staff group, such as the University Senate.

II. Composition

- a. Shall consist of seven Senators.

ARTICLE IV SENATE COMMITTEES

Section B. DUTIES AND COMPOSITION OF COMMITTEES

11.C. NOMINATIONS COMMITTEE

I. Duties

- a. Shall prepare slates of nominees for all committees (excepting the Executive Committee and the Committee on Nominations) for the September meeting.

II. Composition

- a. Shall consist of seven Senators.
- b. Shall be elected at the Reorganization Meeting in May.
- c. Shall be nominated from the floor of the Senate.

ARTICLE IV SENATE COMMITTEES

Section C. COMMITTEE MEMBERSHIP

- a. Except as otherwise provided in these Bylaws, each committee shall consist of seven members.
- b. Membership on the Executive Committee, the Nominations Committee and the Bylaws Committee shall be restricted to members of the Senate.
- c. Membership on the other committees of the Senate must include at least one Senator; otherwise members may be drawn from the entire instructional staff.
- d. Committee members shall serve for a term of three years unless otherwise provided in these Bylaws. Their terms shall be so staggered that the term of office of approximately one-third of members shall expire each year.
- e. Student who are members of Senate Committees must be full-time registrants at the City College.
- f. The agenda for the regular meeting of the Faculty Senate in September shall provide for elections to fill all committee vacancies. In these elections, ballots shall be considered valid only if they are marked for as many candidates as there are vacancies to be filled. Except where otherwise provided in these Bylaws, each valid vote for a candidate shall be given equal weight. After each of a committee's vacancies has been filled by this procedure, the nominee receiving the next highest number of votes will be designated as alternate to that committee with a term of one year. Alternates will be full participants in the affairs of their committees but without the power to vote (the latter being limited to regular members). The temporary absence of a voting member shall give the alternate a vote at the meeting or meetings in question. Alternates shall serve for the remainder of the academic year.
- g. Committee members may be re-elected to serve on the same committee.
- h. Within three weeks after the newly elected, or re-elected committee members have been notified of their election, all committees shall elect their chairmen and notify the Secretary of the Senate of their choice. All committee chairmen must be members of the Faculty Senate unless otherwise provided in these bylaws.

ARTICLE IV SENATE COMMITTEES

Section C. COMMITTEE MEMBERSHIP

- i. The term of a member of a committee expires upon the election of a replacement. A committee, however may remove a non-participating member. A committee member shall be construed to be non-participating if he/she is absent without excuse for two consecutive meetings or from one-third of the meeting in any semester. Any member so removed may appeal his or her removal to the Executive Committee. In the event that such a member is removed from the committee the alternate automatically becomes a full member.
- J. Interim vacancies on both the Executive Committee and the Nominations Committee shall be filled by nomination and election at the first regular meeting following the occurrence of the vacancy, and shall be for the remainder of the unexpired term.
- k. Interim vacancies on other committees will be filled for the remainder of the academic year by their respective alternates. In the absence of an alternate, an interim vacancy shall be filled until the next regularly scheduled committee elections by appointment by the Nominations Committee. Such appointments shall be immediately effective but must be confirmed by the Senate at its first subsequent regular meeting. Vacancies occurring after the regular meeting of the Senate in March may remain unfilled.
- l. Whenever elections for committees are held, additional nominations may be made from the floor by members of the Senate.

ARTICLE IV SENATE COMMITTEES

Section D. GENERAL PROVISIONS

1. The Standing Committees of the Faculty Senate shall appoint the members of the Auxiliary Committees under their supervision, unless otherwise provided in these Bylaws, and shall create such new Auxiliary Committees as they shall deem necessary.
 - a. All appointments shall be subject to confirmation by the Faculty Senate.
 - b. The creation of new Auxiliary Committees shall be subject to confirmation by the Faculty Senate.
 - c. The size and representative character of the Auxiliary Committees shall be determined by the appropriate standing Committee unless otherwise provided in these Bylaws.
2. Each standing committee and each Auxiliary Committee shall elect its own chairman and such other officers as it may need.
3. Auxiliary Committees shall keep the appropriate Standing Committee informed of their actions and decisions.

ARTICLE IV SENATE COMMITTEES

Section E. SPECIAL COMMITTEES

1. When a vacancy occurs in the Presidency of the College, the Faculty Senate shall select the faculty members of an ad hoc committee to advise with the CUNY Board of Trustees in filling the Office.
2. When a vacancy occurs in a college-wide office such as Vice President, Vice Provost, Dean of the School of general studies, and Chief Librarian, the Senate shall select the faculty members of an ad hoc committee to advise with the President in filling the vacancy.
3. Ad hoc committees of the Senate may be appointed by the Presiding Officer with the consent of the Senate, or may be elected at the discretion of the Senate, to serve for a definite purpose and for a definite length of time.

ARTICLE V ORGANIZATION AND MEETINGS OF THE SENATE

A. ORGANIZATION

Section 1. At a meeting, which will be held immediately following, and on the same day as the regular meeting in May, the new Senate shall convene to organize itself for the following academic year.

Section 2. The only order of business shall be:

1. Report of the Committee on Elections.
2. Election of the Secretary, The Treasurer, and the Sergeant-at Arms.
3. Election of the Executive Committee and the Committee on Nominations.

Section 3. After nominations for the various positions are closed, the meeting shall recess for fifteen minutes. At the end of the recess the meeting shall reconvene, not in plenary session, but for the purpose of balloting, which shall be completed within thirty minutes.

B. MEETINGS

Section 1. The Senate shall hold eight regular meetings during the academic year. The meetings shall be held on the third Thursday of the following months: September, October, November, December, February, March, April and May. In the event that the date for a meeting occurs on a day when the College is not in session, the Executive Committee shall set another meeting time or cancel the meeting for that month. The Executive Committee may reschedule a regular meeting of the Senate if, in its opinion, such a change would better serve the conduct of business by the Senate. The Executive Committee shall have the authority to cancel one regular meeting in each semester.

Section 2. Notices of each meeting shall be distributed at least seven days prior to the meeting. Such notices shall include the agenda and written statements concerning any policy matter to be presented at the meeting.

Section 3. Special meetings may be called by the President of the College, by the Executive Committee, or by written request of ten senators (submitted to the secretary of the Executive Committees). The purpose of such meeting shall be explicitly stated in the meeting and shall be the only order of business.

ARTICLE V ORGANIZATION AND MEETINGS OF THE SENATE

MEETINGS

Section 4. A majority of the total number of Senators, not including Alternates, that comprise the plenum if there were no vacancies shall constitute a quorum. In order for a motion to be carried, it must receive an affirmative vote of a majority of the total number of Senators that comprise the plenum. An Alternate designated for each constituency (division or school) shall vote in the absence of a regular member and count toward quorum requirements.

Section 5. Copies of the minutes of each meeting shall be distributed to each member of the Senate, the President of the College, the Chairman of the CUNY Board of Trustees, and the College Library. They shall also be posted on the Senate web page.

ARTICLE VI ORDER OF BUSINESS

Section 1. The preferred order of business for a regular meeting shall be as follows:

Call to Order
Approval of Minutes
Treasurer's Report
Communications
Remarks of the President
Report of the Executive Committee
Report of the Ombudsman
Reports of Committees
Old Business
New Business
Adjournment

Section 2. The order of business as set forth by the Agenda for a given meeting may be altered or suspended on motion and approved by the two-thirds of the members present and voting.

Section 3. Resolutions may be introduced at any regular meeting of the Senate, but shall require two-thirds vote of the members present for addition to the Agenda.

Section 4. Resolutions may be submitted to the Secretary of the Executive Committee and the Secretary of the Faculty Senate for inclusion on the Agenda for the next regular meeting of the Senate. To be included on The Agenda, they must be received ten days before the date of the Meeting for which they are intended.

Section 5. The Agenda for a special meeting may be altered only by consent of three-quarters of the members present and voting.

Section 6. A record of the final vote of each member shall be maintained in the Senate office.

Section-7. When adopted, these Bylaws shall supersede all previous procedures

of the Senate.

Section 8. The Faculty Senate will operate in accordance with the current edition of Robert's Rules of Order, except as otherwise required by these bylaws or by law. Senators should note that compliance with the Open Meetings Law and the Freedom of Information Law is required.

ARTICLE VII AMENDMENTS

- Section 1. Amendments to these Bylaws may be proposed by the Executive Committee, by the Bylaws Committee, or by the petition of five Senators at any regular meeting.
- Section 2. Such proposed amendments shall be read and tabled.
- Section 3. Such proposed amendments shall be part of the order of business of either the next regular meeting or a special meeting called for that purpose.
- Section 4. Notice of such amendments shall be distributed to all members with the Agenda for the meeting.
- Section 5. Amendments to these Bylaws require approval of two-thirds of the voting members of the Senate present at a meeting; provided that two-thirds represents a majority of the voting members of the Senate.
- Section 6. Amendments when approved shall become effective at the next regular meeting of the Senate, unless otherwise provided.

**The Faculty Senate
The City College of New York**



Proposed: December 18, 2014
Adopted: December 18, 2014
Vote: **Unanimous**

Diversity Committee of the Faculty Senate

The following members of the City College Faculty were elected to the Diversity Committee of the CCNY FS (terms: 2015 – 2018)

Marie Nazon (SEEK)
Susanna Rosenbaum (CWE)
Jan Valle (Education)
Karen Hubbard (Science)
Marta Gutman (Architecture)
Prabal De (Economics)
Maria Tamargo (Science)
Jorge Gonzalez (Engineering)
Fred Moshary (Engineering)

Proposed: December 18, 2014
Adopted: December 18, 2014
Vote: **Approved, one no vote**

The Faculty Senate of this City College of New York needs to speak up and express its concern, outrage and opposition to the most recent killings of unarmed black males in Missouri, Ohio, Arizona, and here in New York!

We stand with the families, friends and neighbors of Tamir Rice, Eric Garner, Michael Brown, Romain Brisbon and countless others killed over the years in our unified cry to **“STOP THE KILLINGS NOW!”**

We are grateful, and admire and commend the thousands of people around the U.S. led by a younger generation who have expressed their sadness and outrage through letters, petitions, marches and demonstrations.

We take pride in this outpouring of a true humanity and it gives us hope for the future.

